-1970-

BRISTOL BAY AREA ANNUAL MANAGEMENT REPORT

Larry Van Ray

-INTER-DEPARTMENTAL REPORT-

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
BRISTOL BAY AREA

ANNUAL MANAGEMENT REPORT

-1970-

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PREFACE

Data in the 1970 Annual Management Report supercedes assorted collected information previously reported on. All preliminary data is so indicated by appropriate footnotes.

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INTRODUCTION

Bristol Bay inshore run of red salmon in 1970 was 39,400,000 (Table 1). The commercial harvest of 20,721,000 ranked eighth in the 78 year history of the Bristol Bay commercial fishery. Red salmon catches over 20,000,000 have been made 11 times since the commercial fishery began in 1893. Since 1938, only the 1965 catch of 24,255,000 exceeded the 1970 harvest.

The Department's pre-season inshore forecast of 55,812,000 exceeded the actual run by approximately 16,412,000 (Table 2). The forecast error, in numbers of fish, is attributed largely to the Kvichak River run. The forecast for this river was 43,732,000 or 78% of the total Bristol Bay forecast. The actual run to the Kvichak River was 30,518,000 or 13,214,000 below forecast. Forecast error, percentage wise, was greatest in the Egegik district where the forecast of 4,050,000 was 74% higher than the 2,323,000 actual run. Forecast levels were generally higher than actual runs in all river systems, however, inshore runs to the Snake, Nuyakuk and Togiak Rivers exceeded forecast levels (Tables 1 & 2).

Escapements were considered adequate in all river systems. The total Bristol Bay red salmon escapement was 18,679,000 (Table 1). Escapement goals and management ranges based on the 55,812,000 forecast are listed in Table 2.

The pre-season forecast triggered extensive planning by all organizations associated with the commercial fishery in Bristol Bay. The projected catch of 32,298,000 red salmon if realized, would have been the largest catch in the history of the Bristol Bay's commercial fishery and would have exceeded all previous high catches by approximately 10,000,000 fish. The primary goal of the pre-season planning group was to provide an orderly and maximum allowable harvest of the 1970 red salmon run.

Department and canning industry representatives met several times to discuss plans for processing this run. In addition, the Governor of Alaska appointed an Ad Hoc Research Committee to seek solutions to the anticipated problems associated with processing a run of this magnitude. Consideration was given to the possibility of inviting foreign processors to participate in the harvest. As planning progressed the canning industry made commitments to operate at maximum capacity in the Bay with an equivalent of 35 one-pound lines in operation and provide tender service to transport approximately 3,500,000 red salmon from Bristol Bay to other processing sites in Alaska. In addition, the Board of Fish and Game adopted several regulatory proposals which, in general, relaxed restrictions concerning fishing areas, gear and registration, with the intent of facilitating the 1970

harvest.

Probably the most controversial regulation adopted by the Board was the regulation to create another fishing district, the General district, outside the regular fishing districts and to extend the boundaries of the Naknek-Kvichak and Egegik districts (Figure 1). The intent of this regulation was to permit earlier fishing on the run, thereby reducing the size of catches required during the peak of the run to achieve the desired season harvest. Some resident fishermen objected to this regulation, contending that it would permit fishing on mixed stocks and increase the possibility of overfishing stocks of rivers which were not major contributors to the total Bristol Bay forecast.

A post-season review showed that only minimal fishing effort occurred in the General district and extended sections of the Naknek-Kvichak and Egegik districts. Approximately 360,000 red salmon, about 2% of the total catch, were caught in the General district (Table 11). In summary, creation of the new General district and the extended sections of the other two districts contributed very little to enhancement of the 1970 harvest and apparently did not lend to overfishing of any particular stocks. Fishing in the General district will be discussed in more detail in the district summaries.

Approximately 2,800 units of gear were registered to fish in Bristol Bay in 1970 (Table 3). This is about a 100 unit decrease from 1969 but still indicative of the general increase in gear effort since 1960. The sliding gear scale, used in 1969 and designed to limit allowable fathoms of gear, was discarded in 1970. Drift gillnet fishermen in the Naknek-Kvichak, General and Egegik districts were allowed to use 200 fathoms of gear prior to July 1 after which 150 fathoms were legal limit. Similarily, set net fishermen in the Naknek-Kvichak and Egegik districts were allowed to use 75 fathoms of gear before July 1 and 50 fathoms thereafter. In other districts 150 fathoms of drift gear and 50 fathoms of set net gear were the maximum lengths for the entire season. A major portion of the catch was again taken with drift gill nets (Table 13).

Eleven shore canneries processed salmon in 1970 (Table 18). Twenty nine one-pound lines and an equivalent of 14 one-half pound lines were in operation for most of the season. It was estimated that these facilities had a canning capacity of approximately 1,500,000 fish per day (using 3,000 one-pound cases per-line-per-day capacity and 15 fish per case). Additionally, nine freezer ships, one ship cannery and two shore based freezer plants were in operation (Table 18). Twelve operators were salting, hand packing or fresh marketing salmon during the season (Table 18).

Approximately 290,000 red salmon were airlifted out of Bristol Bay to canneries in Kenai, Seward and Anchorage and 2,713,000 were shipped out in brine for processing at other locations (Table 15).

The airlift provided a new market potential for Bristol Bay fishermen. It is quite probable that this market will develop and increase in the future with improvement of facilities and techniques for unloading fish from boats. The continued increase of fresh-frozen and cured fish production in Bristol Bay demonstrates another market that probably has not reached its potential level.

The 1970 salmon catch, all species combined,was 22,051,00, the second highest catch in the past 20 years (Table 12). For the same 20 years, 1951-1970, 1970's 20,721,000 red salmon catch ranked second; the 141,000 king salmon catch ranked first; the 718,000 chum salmon catch ranked fourth; the even-year pink salmon catch of 457,000 ranked sixth; and the 14,000 coho salmon catch ranked seventeenth. Red salmon accounted for 94% of the total 1970 catch, kings 1%, chums 3% and pinks 2%. The catch by species and district is summarized in Table 12.

The first wholesale value of the 1970 salmon case pack of fish processed in Bristol Bay was estimated to be $51,874,000. The first wholesale value of all commercial fisheries products (canned, fresh, frozen and salted salmon; salmon roe; herring sac-roe; and roe-on-kelp) from Bristol Bay was approximately $64,822,000. in 1970 (includes fish processed outside Bristol Bay and in Canada).

The Department of Fish and Game allocated over $400,000 for commercial fisheries management and research activities in Bristol Bay during fiscal year 1970-71. Projects included escapement enumeration and sampling, catch sampling, smolt enumeration, offshore and inshore test fishing, spawning ground surveys, forecast analyses, monitoring and sampling herring, herring roe-on-kelp, and commercial fresh water fisheries, monitoring subsistence fisheries and maintenance of office and field camp facilities and equipment.

Bristol Bay commercial red salmon catches during the past 10 years (1961-1970) totaled 93,141,000 fish, 25,778,000 above the catch for the previous 10 years (1951-1960). Hopefully this increasing trend will continue and the status of the stocks will achieve the level of the 1930's when the 10 year (1931-1940) commercial red salmon catch was 159,666,000 fish.

DISTRICT SUMMARIES

GENERAL DISTRICT

The General district included waters east of a line from Cape Menshikoff to a point east of Etolin Point, excluding all portions of the Naknek-Kvichak, Egegik or Ugashik districts (Figure 1).

Most pre-season planning involved efforts to provide a maximum orderly harvest of a forecasted record breaking red salmon run. The General district was established to permit intensive fishing on the run early in the season, thereby reducing the size of catches required during the peak of the run to meet the desired season harvest and consequently reducing the possibility of "plugging" processing facilities.

Fishermen were permitted to transfer to and fish in the General district without the 48-hour waiting period normally required for transferring and could use 200 fathoms of drift gear before July 1.

Management

Fishing for red salmon began about June 15 and continous fishing was permitted in the General district until it was closed by emergency order effective 6 a.m., June 30. Fishing effort in the General district comprised only 20% of the total fishing effort observed in the Naknek-Kvichak, Egegik and General districts from June 16 through June 29. Most of this effort was concentrated in an area from 3 to 9 miles offshore from Cape Chichagof.

Catch

Red salmon catches progressed slowly from about 2,000 to 4,000 per day through June 22 and did not top the 100,000 per day mark until June 27 (Table 11). Approximately 381,000 salmon were caught in the General district (Table 11). The red catch was 360,000 or 94% of the total district catch, chums 21,000 or 5% and kings 1,000 or 1% (Table 11). The General district red salmon catch was apportioned to individual river systems as follows: 280,000 to the Kvichak River; 9,000 to the Branch River; 34,000 to the Naknek River and 37,000 to the Egegik River.

NAKNEK-KVICHAK DISTRICT

The 1970 Naknek-Kvichak district was approximately doubled in size from 1969. The Naknek and Kvichak subsections A represented the district size as it was in 1969, and Naknek and Kvichak subsections B were added in 1970 (Figure 1). The B subsections of this district, particularily the Naknek subsection B, received considerable fishing effort early in the season. Approximately 22% of the total fishing effort observed in the Naknek-Kvichak, Egegik and General districts from June 16 through June 2º was concentrated in Naknek subsection B from Johnston Hill to Middle Bluff.

Fishing effort began shifting to the A subsections about June 27 when catches in the Naknek-Kvichak district reached the million fish per-day level (Table 6). Approximately 70% of the total fishing effort observed in the Naknek-Kvichak and Egegik districts from June 30 through July 10 was in Kvichak subsection A, particularily concentrated near the west side.

Pre-season fishing gear registration totaled 1313 units, 940 drift nets and 373 set nets in 1970 (Table 3). This represents 47% of the total 2,771 gear units registered to fish in Bristol Bay. Total gear registration for 1970 was about 125 units lower than 1969, however gear registration for the Naknek-Kvichak district was about 60 units higher. Approximately 85 more drift nets and 25 less set nets than in 1969 were registered to fish in the Naknek-Kvichak district in 1970. The drift gear increase could probably be attributed to the fact that this district accounted for 84% of the forecasted total Bristol Bay inshore red salmon run. Most of the larger fishing boats from the Nushagak and Egegik districts had transferred to the Naknek-Kvichak district by June 30 and July 4, respectively.

The district inshore red salmon forecast of 47,149,000 was comprised of 43,732,000 to the Kvichak River, 513,000 to the Branch River and 2,904,000 to the Naknek River (Table 2) while total actual runs were 30,518,000, 406,000 and 1,725,000 respectively (Table 1). The actual total district run was 14,500,000 (31%) below forecast. The Kvichak River total run was 13,214,000 (30%) below forecast, Branch River was 107,000 (21%) below forecast and Naknek River was 1,179,000 (41%) below forecast.

Management

Commercial fishing for red salmon in the Naknek-Kvichak district began May 25 and, except for early season week-end closures and a short closure in the Naknek section, continuous fishing was permitted throughout the season. The Naknek section was closed for 50-1/2 hours beginning July 11, and was open for set net fishing only from July 13 through July 17 to enable escapement build up in the Naknek River.

Daily red salmon catches in the Naknek-Kvichak district remained below the million mark through June 26, despite early, continuous fishing effort (Table 6). Catches averaged 1,079,000 fish per day for the next 14 days, from June 27 through July 10 (Table 6). Bad weather restricted fishing effort on July 11 and 12, and when normal effort resumed on July 13 it soon became apparent that run strength had dropped significantly. The July 13 catch was less than 200,000 and catches declined steadily thereafter (Table 6).

Most major shore-based canneries placed their fishermen on 2,000 fish-per-boat and 1,000 fish-per- set net limits June 15 and began regulating fishing time for their respective fishermen on June 28 (Table 5). Generally, canneries permitted their fleets to fish for 12 to 24 hours with 12 to 24 hour closures between fishing periods (Table 5). Canneries altered their fishing periods in such a manner that fishing effort (number of boats on a given day) was constant during the 14 days of peak catches (Table 5). Cannery fleets were again permitted to fish continously after July 11.

Over-all preliminary age composition of the Naknek-Kvichak red salmon catch and escapement combined was 5% 4-year fish from the 1966 parent year escapement, 92% 5-year fish from 1965 and 3% 6-year fish from 1964.

Catch

The Naknek-Kvichak district commercial catch of all species was 17,633,000 salmon, 219% above the 20-year average of 5,534,000. This catch represented 80% of the 1970 total Bristol Bay catch.

The 17,481,000 red salmon harvest accounted for 99% of this district's catch (all species) and represented 84% of the total red catch for all districts in Bristol Bay. The red salmon catch was 225% above the 20-year average of 5,384,000.

Preliminary age composition of the red salmon catch was 5% 4-year fish from the 1966 parent-year escapement, 92% 5-year fish from 1965 and 3% 6-year fish from 1964. Preliminary sex ratio of the commercial catch was 48% males and 52% females.

The 1970 king catch in the Naknek-Kvichak district was the second highest king catch made in the past 20 years. The 18,000 fish catch was almost identical to the 1969 harvest and was approximately 9,000 above the 20-year average of 10,000 fish.

The 1970 chum salmon catch in the Naknek-Kvichak district ranked ninth in chum catches made during the past 20 years. The 105,000 fish catch was only 8,000 below the 20-year average and was the largest chum catch made since 1964.

Pink Salmon catches were considerably below even-year averages in all Bristol Bay fishing districts. The 28,000 pink catch in the Naknek-Kvichak district was the lowest even-year catch since 1960 and was well below the average of 51,000 fish for even years since 1952.

Escapement

Red salmon escapements to the Kvichak, Branch and Naknek Rivers were enumerated from counting towers. In addition, test fishing at the mouth of the Kvichak River provided daily escapement indices and aerial surveys were flown each day, weather permitting.

Escapement to the Kvichak River totaled 13,935,000 and was the lowest peak-year escapement recorded for this river since 1956.

The Kvichak River escapement preliminary age composition consisted of 1% 4-year fish from the 1966 parent year escapement, 97% 5-year fish from 1965 and 2% 6-year fish from 1964. The preliminary escapement sex ratio was 39% males and 61% females.

Branch River escapement totaled 177,000 which is considerably below the 16-year (1955-1970) average of 311,000. Escapement to this river is incidental to the Kvichak River escapement and cannot be separately managed. Preliminary escapement age composition was 2% 3-year fish from 1967, 75% 4-year fish from 1966, 18% 5-year fish from 1965 and 5% 6-year fish from 1964. The preliminary sex ratio of the escapement was 46% males and 54% females.

The 733,000 Naknek River escapement was 21% below the 16-year (1955-1970) average. Preliminary age composition of the escapement was 46% 4-year fish from 1966, 49% 5-year fish from 1965 and 5% 6-year fish from 1964. The preliminary escapement sex ratio was 48% males and 52% females.

EGEGIK DISTRICT

The 1970 Egegik district was also enlarged to compensate for the anticipated record-breaking red salmon run. Subdistrict A represented the district size as it was in 1969 and subdistrict B was added for the 1970 season (Figure 1). The B subdistrict was utilized by fishermen during the entire season, unlike the Naknek-Kvichak B subsection in which little fishing effort was observed after the run had developed to full strength.

Approximately 419 gear units, 236 drift nets and 183 set nets, were registered to fish in the Egegik district in 1970 (Table 3). This represented 15% of Bristol Bay's total gear registration in 1970.

Egegik's inshore red salmon forecast was 4,050,000, divided into an escapement goal of 1,000,000 and a projected catch of 3,050,000. The actual run totaled 2,323,000 fish, a 1,404,000 catch and a 920,000 escapement, and was 43% lower than forecasted (Tables 1 & 2).

Management

Commercial fishing commenced June 1 and was permitted continuously through July 4, except for early-season week-end closures (Table 7). The total red salmon catch through June 30 was only 508,000 (Table 7). Daily catches for July 1 and 2 respectively were 164,000 and 130,000. The July 3 catch dropped to 63,000 and on July 4 the catch bounced back up to 168,000 (Table 7).

The fishery was subsequently closed at 10 p.m. on July 4 to permit further analyses of an apparently weak run. On July 3 only 100,000 fish had been observed in the lagoon survey and only 31,000 had passed the counting tower. Additionally, aerial surveys indicated a weak showing of fish in the river below the lagoon. The district remained closed until test fishing and aerial surveys indicated a substantial build-up of fish in the fishing district and the river.

The district reopened for 12 hours on July 6 after a 37-hour closure. All but about 60 boats had transferred to the Naknek-Kvichak district during the closure. The catch for the 12-hour July 6 period was approximately 100,000 (Table 7). Inside test fishing indices remained high after this period and thus another 12-hour opening was permitted on July 7 (Table 7).

This period produced a surprisingly low catch of only 77,000 reds, due, in part, to fishing restrictions placed on fishermen by one of the canneries in Egegik.

The district was reopened for a 12-hour period on July 9 after a 25-hour closure. Effort was reduced to only 13 boats plus the set nets by this time. Lagoon surveys and test fishing indices on July 9 left little doubt that escapement within the desired range would be achieved and the district was consequently opened to fishing until further notice before the 12-hour , July 9, period ended (Table 7).

Egegik drift net fishermen were placed on 2,000 fish-per-boat-per-day-limits during most of the season by their respective canneries and set-netters were placed on limits of 1,000 fish per day.

Over-all preliminary age composition of Egegik red salmon catch and escapement combined was 3% 4-year fish from the 1966 parent year escapement, 84% 5-year fish from 1965 and 13% 6-year fish from 1964.

Catch

The commercial salmon catch of all species for the Egegik district in 1970 was 1,416,000 (Table 7). This catch ranks slightly above the 20-year average of 1,224,000 and accounted for 6% of the total Bristol Bay catch.

The 1,367,000 red salmon catch accounted for 97% of the district's total catch and 7% of the Bristol Bay total red salmon catch. Egegik's red salmon catch was approximately 175,000 fish above the average red catch for this district over the past 20 years.

Red salmon preliminary age composition of the catch was composed of 1% 4-year fish from the 1966 parent year escapement, 85% 5-year fish from 1965 and 14% 6-year fish from 1964. The preliminary sex composition was 56% males and 44% females.

The 4,000 king salmon catch was slightly above average for the past 20 years. The highest king catch in this district in recent years was 10,000 in 1954 and the 20-year average is 3,000.

The 38,000 chum catch ranked fourth in chum catches made in this district during the last 20 years. The 20-year average is 26,000.

The coho catch ranked second in catches made since 1951. The 7,000 fish catch is over double the 20-year average of 3,000.

Escapement

The Egegik River red salmon escapement was enumerated from a counting tower located between the Egegik Lagoon and Lake Becharof. Test fishing near the mouth of the Egegik River and aerial surveys of the lagoon provided daily escapement estimates used for in-season management of the fishery.

Egegik River escapement totaled approximately 920,000 and was within the desired management range (Tables 1 & 2). The 20-year average escapement is 818,000 and peak-year escapement since 1956 have averaged 1,317,000 fish. Preliminary age composition of the escapement was 5% 4-year fish from the 1966 parent year escapement, 84% 5-year fish from 1965 and 11% 6-year fish from 1964. The preliminary escapement sex ratio was 28% males and 72% females.

UGASHIK DISTRICT

The Ugashik district remained the same size as it was in 1969.

The inshore forecast for this district was 1,252,000 fish, consisting of an escapement goal of 700,000 and a projected harvest of 552,000 (Table 2). The actual run totaled 907,000 and was comprised of a 172,000 fish catch and an escapement of 735,000 (Table 1). The actual run was approximately 28% below forecast level.

Management

The district was open to continuous fishing throughout the season but fishing effort was limited by the number of processors operating in the district (Table 18). Three freezer ships operated in the district for most of the season and one brine scow took fish for three days. The freezer ships took fish from only nine drift netters and one set net within the district, plus four set net sites at Ugashik Village. Limits of 600 fish-per-boat-per-day were placed on the drift gillnet boats by the fish buyers and additionally the Ugashik Village set netters were limited to a composite total of 1,000 fish-per-day. An additional 17 boats and 6 set nets fished from July 14-17, when the brine scow was in the district. The scow received 48,000 fish during its 3-day stay.

Over-all preliminary age composition of the Ugashik red salmon catch and escapement combined was 76% 4-year fish from the 1966 parent year escapement, 22% 5-year fish from 1965 and 2% 6-year fish from 1964.

Catch

The red salmon catch through June 28 totaled only 13,000 (Table 8). Over 10,000 reds were caught on June 29 and the run peaked in the fishing district from July 1 through July 4 (Table 8). As previously mentioned, the catch was restricted by limited processing facilities. Approximately 97,000 reds had been caught through July 12. A brine scow arrived in the district July 14 and during the period from July 13 through 19 another 68,000 reds were caught. Red catches dropped sharpley after July 19 (Table 8).

The 193,000 fish catch of all species for the season was less than half the average all species catch for the last 20 years, 439,000. The 172,000 red salmon catch was equally below the 20-year average of 411,000 and ranked fourth from the lowest made in the Ugashik district since 1951. The red salmon catch was comprised of 61% males and 39% females, while the preliminary age compostition was composed of 55% 4-year fish from 1966, 39% 5-year fish from 1965 and 6% 6-year fish from 1964.

The king salmon catch totaled over 1,000 fish and was approximately 32% below the 20-year average of over 2,000. Comparatively, the highest king catches made in the Ugashik district in the last 20 years were during the 1959 and 1965 seasons when 5,000 and 4,000 respectively, were caught.

The chum salmon catch totaled 18,000. This is nine times the number caught in 1969, but slightly below the 21,000 average for the past 20 years.

The coho catch of just under 2,000 was less than half of the 4,000 fish average for the past 20 years and over 7,000 below the 1969 coho catch.

Escapement

The red salmon escapement was enumerated from a counting tower on the Ugashik River near Lower Ugashik Lake. Test fishing was not conducted at the river mouth during the 1970 season. The 735,000 fish escapement marked achievement of the pre-season escapement goal which was 700,000 (Tables 1 & 2).

Ugashik River red salmon escapements have averaged 519,000 since 1951 and in only three years since then have escapements exceeded the 1970 level. Preliminary escapement age composition was 81% 4-year fish from the 1966 parent year escapement, 18% 5-year fish from 1965 and 1% 6-year fish from 1964. The preliminary sex ratio of the escapement was 57% males and 43% females.

NUSHAGAK DISTRICT

The Nushagak district fishing boundaries remained unchanged from 1969, and no boundary relocations were implemented during the course of the salmon season. Considerable thought had been given, prior to the season, to relocating both the outer and inner Igushik section boundaries to allow additional harvest on the expected large red salmon return to the Igushik River system. However, as the season progressed it was not necessary to relocate the Igushik section boundaries.

Seperate openings between the Igushik and Nushagak sections were again employed in 1970. This management technique has allowed greater flexibility in managing the Igushik River red salmon stocks to obtain the desired escapement. The Snake River section remained closed for the tenth straight year in an effort to protect the small expected red salmon return.

The emergency order period, which began on June 15 and continued through July 22, was preceded by a 5-day per-week fishery on Nushagak king salmon stocks. Prior to June 22, king salmon fishermen are allowed to fish in the outer areas of the Nushagak district, with the boundary being designated by the traditional "King Salmon line". Effective June 22 the open fishing area is pulled back to the "red salmon line", to protect milling red salmon in the area outside of Etolin Point.

Pre-season fishing gear registration for the district was 815 gill nets, including both drift and set net gear, 75 less than in 1969 and similar to the 1968 pre-season registration (Table 3). Of this total, 82% were resident fishermen and 18% non-residents. Of the 246 set nets registered for fishing in 1970, only about 170 actually participated in the fishery. Many resident fishermen license both drift and set net gear but do not actually use their set net gear, thus the pre-season set net registration is always higher then the number in actual use (Tables 3 & 4).

Due to the large red salmon forecast to the Naknek/Kvichak district, the major portion of the Nushagak drift fleet transferred to the east side of the Bay. Approximately 350 vessels had transferred out of the Nushagak distirct by June 30, the remaining fleet, estimated at 180 boats, consisted primarily of skiffs, double-end sailboat conversions and older boats. It was estimated that there were less than 20 "big" fisning boats left in the Nushagak, prior to the peak of red salmon run.

The highest effort recorded for drift and set net gear, based on fish ticket delivery tabulation, indicated that 272 units of drift and 158 units of set net gear for a total of 430 units of gear participated in the fishery at the peak of the red salmon run (July 2-8), and 416 units at the peak of the pink salmon run (Table 4). The large discrepancy between pre-season registration and actual gear in use during the season is accounted for by transfers of gear to other fishing districts and by double-registrants as discussed above. The amount of gear in use at the peak of the red salmon run has remained remarkably similar in the Nushagak district since 1967, and 1970 showed the first significant reduction in gear since 1967 (ie: 1967-569; 1968-566; 1969-547 and 1970-430).

The total district inshore red salmon forecast of 3,089,000 had 1,865,000 assigned to Wood River; 680,000 to Igushik River; 400,000 to Nuyakuk River; and 144,000 to Snake River and the Nushagak-Mulchatna system combined (Table 2). Total return runs based on preliminary apportionment of the commercial catch by river system were: Wood - 1,736,000; Igushik - 686,000; Nuyakuk - 607,000; and Snake/Nushagak-Mulchatna - 126,000; for a total run of 3,155,000 or within 2% of the forecasted run to the district (Table 1).

The pink salmon forecast of 2,500,000 failed to materialize. The actual return was 570,000 fish catch and escapement combined, only 23% of the forecast. Pre-season harvest levels were forecast for the king and chum salmon stocks of the Nushagak district for the first time. The king salmon projected harvest range was set at 65,000 to 85,000 fish with the most probable harvest at 75,000; while the chum salmon harvest range was set at 150,000 to 200,000 fish with the point estimate at 175,000. Both runs exceeded the estimated harvest levels, with the king salmon harvest of 88,000 fish approaching the upper end of the harvest range, while the chum harvest of 435,000 was over 2-1/2 times the pre-season estimate.

Nine processors bought salmon in the Nushagak in 1970 (Table 18). The three major canneries operated 11 canning lines (ie: C.W.F. - three - 1 lb. talls and one - 1/2 lb.; P.A.F. - two - 1 lb. talls and one - 1/2 lb.; and Queen - one - 1 lb. tall, two - 1/2 lb. and one - 1/4 lb.), while six fresh-frozen and cured fish operators bought fish throughout the season.

Management

The king salmon harvest prior to commencement of the emergency field regulation period (June 15) was 25,000 fish, slightly lower than the average catch (27,000) for this stage of the run. The first 24-hour fishing period of the emergency regulation period (June 15-16) produced a poor catch of 3,000 kings, under calm weather conditions (Table 9). Another 24-hour period was announced for June 17-18, and when it was evident that king catches were being held down due to severe storm conditions, the period was extended for an additional 24-hours. The resultant 48-hour catch (June 17-19) was 22,000 king salmon, and brought the accumulative season catch to 50,000 kings, slightly below the long-term average catch of 55,000 for the same date.

The Nushagak section was kept closed for 75 hours between June 19-22 to allow additional king salmon escapement. However, due to the large red salmon forecast to the Igushik section and the fair showing through June 19 (ie: 8,000 red salmon caught), the Igushik section was opened for a 48-hour fishing period for June 20-22. The resultant red salmon catch of over 2,000 fish brought the season catch for this section to 10,000, considerably higher then the long-term average catch of 4,000 for this stage of the run. When the decision was made to re-open the Nushagak section for a 30-hour period on June 22-23, the Igushik section was also opened, which in effect, extended the fishery 30 hours, allowing 78 hours of uninterrupted fishing time (Table 9).

The 30-hour fishing period on June 22-23 resulted in poor catches of 8,000 red salmon and 5,000 king salmon. Based on the lateness of significant red catches and the small commercial fleet left in the Nushagak (ie: over 300 units of drift gear had transferred from the Nushagak district through June 23), the Nushagak district was re-opened for 24 hours on June 24-25 after a 22-hour closure (Table 9).

Based on a fair showing of fish in the Igushik River and a commercial harvest of 16,000 fish, through June 25 compared to the average catch through the same date, the Igushik section was extended 30 hours, through June 26. The Igushik section was subsequently extended for an additional 45 hours, due to the reduced fishing effort (55 set nets and 20 drift skiffs) and fairly small catch to date (18,000) and the expected large return (Table 2).

The 22-hour Igushik section closure on June 23-24 subsequently proved to be the last Department closure of the season for this section. Between June 24 and July 7 when the Igushik section was opened until further notice, this sections fishing time was extended nine times. The section was extended repeatedly rather then opened until further notice so that Management could retain the flexibility needed to gauge the strength of the run in this important fishery.

After a 51-hour closure, the Nushagak was re-opened on June 27. When it became apparent that catches were small, the opening was extended for 24 hours to June 29. The 48-hour catch amounted to 74,000 red salmon, which brought the accumulative catch to 114,000 compared to the average of 173,000 through this date (Table 9).

Because of the small number of boats fishing the Nushagak, (estimated at 190), most of which were double-end sail-boat conversions and skiffs, and due to the large expected commercial harvest of 1,600,000 red salmon, considerable concern was expressed over the ability of the fleet to handle the number of fish required to balance the catch and subsequent escapement. Further compounding the problem was the fact that the red salmon run was late in the Nushagak and would probably peak abruptly when it did arrive. In addition all major canneries in the Nushagak were on a 2,000 fish-per-boat limit and 1,000 fish-per-set net limit due to large numbers of fish arriving to be canned from the Naknek/Kvichak. All of these factors prompted a liberal approach to management of the Nushagak red salmon run. With this in mind, the 48-hour waiting period for transfer of gear into the Nushagak district was waived on June 29. In the event of a abrupt peak in the run the Nushagak fleet, which had transferred to other districts, would be able to return without compliance with the usual 48-hour waiting period. As will be seen later this emergency regulation was effective in increasing the Nushagak harvest by about 50,000 fish.

The district fishing time was extended again on June 29 for an additional 48 hours to July 1, and again for 24 hours on July 1 to 7 p.m. on July 2 (Table 9). The commercial red salmon harvest for the 48-hour period ending on July 1 was 65,000 fish which brought the total accumulative catch to 180,000. Boats fishing near the outside boundary line began to pick-up good numbers of fish on the evening flood tide on July 1. Catches were estimated to be in the neighborhood of 1,000 to 1,500 + per boat, however, very few units of gear were in that area.

The mid-day flood tide on July 2 saw the Nushagak red salmon "hit". Fish which had previously been drifting back and forth with the tides, now began to move actively up-river. Total catch for the 24-hour period from 7 p.m. on July 1 to 7 p.m. July 2, amounted to 306,000 fish, of which 271,000 were reds (Table 9). Over 60,000 red salmon alone were caught by Ekuk beach set netters, one of the heaviest catches ever recorded. The chum salmon catch, which had been averaging 75% of the total red-chum catch, dropped to 15% and it was obvious to all concerned that the late Nushagak red salmon run had arrived.

Over 25 boats took advantage of the Departments emergency regulation waiving the 48-hour waiting period for transfer into the Nushagak district. Since almost all large boats filled their limit, this regulation had the immediate affect to increase the Nushagak catch by 50,000 fish.

With the exception of the Igushik section, which remained open to fishing the Nushagak was allowed to close at 7 p.m. on July 2 to balance the escapement with the commercial harvest. Accumulative red salmon catch through July 2 was 450,000, while escapements in the two major river systems totaled 14,000: Wood River - 5,000 and Igushik - 9,000.

No particular concern was felt as a result of the low Wood River escapement, for previous experience has shown that this system's escapement canbuild very fast and that the Department has the necessary flexibility to assure adequate escapements. We were, however, concerned about the fate of the Igushik red salmon run. Through July 2 only 9,000 fish had been counted past the tower, while the fishery was estimated to have taken 100 to 150,000 reds. Normally the Igushik red salmon run is earlier then Wood River and usually peaks in the commercial fishery between June 27-30. By July 2 it was still difficult to determine if a peak had occurred. However, based on the small effort in the section (20 drift skiffs and 55 set nets) and feeling that the Igushik forecast of 680,000 was still good, it was decided to continue un-interrupted fishing in this section.

Columbia-Wards Fisheries, which has 100% of the fishing effort on the Igushik beach, suspended fishing in that section for 13 hours, from 8 a.m. to 9 p.m. July 3 due to an over-abundance of fish waiting to be canned.

Continued aerial surveilance of Wood River failed to detect a significant increase in the escapement until July 4, when over 10,000 fish were counted in the upper river below the counting tower under poor survey conditions. Based on the increase in escapement rate (accumulative escapement of 21,000 through 10 a.m. July 4) and with every factor pointing to large numbers of fish between the counting tower and the fishery, it was decided to allow a 12-hour fishing period on July 5. The resultant 12-hour period produced a catch of 152,000 red salmon and brought the accumulative catch to 653,000 (Table 9). The Wood River escapement continued to build with 122,000 fish passing the tower on July 4, 116,000 on July 5 and 148,000 on July 6 for an accumulative escapement of 394,000 through July 6.

Aerial survey of Wood River on July 6 indicated that the accumulative counts should go close to 400,000 by mid-night and based on an adequate balance between catch and escapement and every indication of additional fish in the river above the fishery, a 12-hour fishing period was announced for July 7. An aerial survey of Wood River on July 7 indicated a daily escapement of 200,000 red salmon and a accumulative escapement of 600,000 through July 7. Based on the very adequate escapement and the estimated harvest of 855,000 fish through July 6, the Nushagak section was extended for an additional 24 hours. After an early morning aerial survey of Wood River on July 8 which showed a solid string of fish in clear water and an estimate of 128,000 past the tower by 6 a.m., the Nushagak section was opened until further notice.

The Igushik section remained open to fishing the entire season, when daily aerial surveilance indicated adequate numbers of fish escaping the fishery. In addition to the cannery inforced closure on July 3, the Igushik fishery was closed by the cannery on July 7-8 for 24 hours due to a break-down of the tender hauling fish from that area. In the end, the Igushik beach set and drift skiff fishery caught 218,000 red salmon, while the escapement went to 371,000 fish. The Wood River final escapement was 1,162,000 while the total Nushagak district catch of red salmon amounted to 1,189,000 fish.

On July 10 the 48-hour waiting period for transfer between districts was waived for any of the Nushagak fleet wishing to move to Naknek/Kvichak district to participate in the very good late "scratch" fishing in that district.

Over-shadowed to some extent by the extremely good red salmon run to the Nushagak district, was the exsistence of a strong run of chum salmon. Significant chum salmon catches began on June 22-23 (25,000) and continued through July 12-18 (23,000) and totaled 435,000 fish by the end of the season (Table 9).

With the large forecast of pink salmon (2,500,000) to the Nushagak, considerable effort began to transfer back to the district to participate in this fishery, which began on July 15, the date small mesh (4-1/2" stretch measure) gear was allowed to be first used. Due to the large catch of red salmon, particularly in the Naknek-Kvichak area, and the relatively poor early catches of pink salmon, only 325 boats and skiffs and 91 set nets participated in the fishery compared to the usual 550 to 600 boats and 150 set nets. The season total pink salmon harvest was a disappointing 418,000 fish, well below the catches for the previous four cycle years (Table 9).

The weather in 1970 was generally good, with several long periods of cold cool weather, which proved to be fortunate due to the large amounts of red salmon that were held on tenders, especially in the Naknek-Kvichak area.

Over-all preliminary age composition of the Nushagak red salmon catch and escapement combined was 34% 4-year fish from the 1966 parent year escapement, 63% 5-year fish from 1965 and 3% 6-year fish from 1964.

Catch

The Nushagak district commercial catch for all species of salmon was 2,133,000, representing 10% of the total Bristol Bay catch for 1970 (Table 12). This catch was 27% higher then the 20-year average of 1,676,000 for the district.

The red salmon catch of 1,189,000 represented 6% of the Bristol Bay total harvest, and was 28% higher then the average catch of 931,000 since 1951. Preliminary age composition of the district red salmon catch was 23% 4-year fish from the 1966 parent year escapement, 72% 5-year fish from 1965 and 5% 6-year fish from 1964. Preliminary sex ration was 44% males and 56% females, while the preliminary average weight for reds caught in the Nushagak section was 5.7 pounds and 6.1 pounds for reds caught in the Igushik section.

The Nushagak district king salmon catch of 88,000 was the third largest catch in the last 20 years and was 33% higher then the average catch of 66,000 for this period. Over 38% or 747,000 pounds were marketed as fresh-frozen or mild-cured products, the balance being canned and producing a case pack of over 10,000 on a 1 lb. tall basis. Preliminary average weight of kings sampled randomly throughout the season was 22.1 pounds, while preliminary sex ratio was 60% males and 40% females.

The total catch of chum salmon of 435,000 was 90% higher then the average district catch of 229,000 for the past 20 years. Preliminary average weight was 6.6 pounds, while the preliminary sex ration of the commercial catch was 43% males and 57% females.

The even year pink salmon run to the district produced a catch of 418,000 fish, 64% lower then the average even year catch of 1,177,000 for the past 7 even years. The fish per case at the two major canneries on the Nushagak was over 28.7 and random sampling of the catch showed that the pinks averaged 2.8 pounds. The small size of the fish in the commercial catch was a direct result of a mesh size reduction from 4-3/4 to 4-1/2 inches stretch measure, which was effected in 1970. The selective gill net fishery produced a catch that was composed of 54% male fish and 46% females.

Late season catches of coho salmon amounted to 4,000 fish and was the smallest catch since 1965, and well below the 20 year average catch of 28,000. The low harvest in 1970 was due primarily to lack of effort.

Escapement

Counting towers were maintained on Wood, Igushik, Nuyakuk and Nushagak Rivers for the purpose of enumerating red salmon escapement into these systems. Aerial surveys were employed to determine red salmon escapement into the Snake River system, where a tower station is not maintained.

Total red salmon escapement to the district was 1,966,000 or 62% of the total red run (Table 1). The final escapements and percent of the district total by system were: Wood - 1,162,000 (59%); Igushik - 371,000 (19%); Nuyakuk - 365,000 (19%); Nushagak-Mulchatna - 45,000 (2%); and Snake - 24,000 (1%) (Table 1). The 1970 total district escapement was 63% higher then the 20-year average of 1,205,000.

One of the major problems involved in managing the Nushagak district is the difficulty of achieving differential harvest rates on red salmon stocks bound for the different rivers in the district. Escapements into the Wood and Nushagak-Mulchatna systems were all within the desired management escapement ranges. However, escapements into the Igushik, Nuyakuk and Snake River systems were slightly above the desired range.

Preliminary analysis of scales showed that the major age classes of the red salmon escapement to the major rivers were: Wood - 57% 4-year fish from 1966, 41% 5-year fish from 1965 and 2% 6-year fish from 1964; Igushik - 11% 4-year fish, 85% 5-year fish and 4% 6-year fish; Nuyakuk - 22% 4-year fish and 78% 5-year fish; and Nushagak-Mulchatna - 2% 3-year fish, 27% 4-year fish and 71% 5-year fish. Overall age composition of the Nushagak district red salmon escapement was 41% 4-year fish from the 1966 parent year escapement, 57% 5-year fish from 1965 and 2% 6-year fish from 1964. Preliminary sex ratios of the major river systems red salmon escapements were: Wood - 46% males and 54% females; Igushik - 38% males and 62% females; Nuyakuk - 35% males and 65% females; and Nushagak-Mulchatna - 39% males and 61% females.

To derive an estimate of the Nushagak district king salmon escapement, it is necessary to evaluate: spawning ground surveys (7,000 counted by aerial means); index tower counts (2,000 counted past the Nushagak tower) and commercial (88,000) and subsistence (6,900) catches. The estimated total district king escapement of 40,000 to 50,000 was made after analysis of these data.

Pink salmon were enumerated and sampled at the Nuyakuk River counting station where the majority of the district escapement passes on their way to the spawning grounds in the upper portion of the Nuyakuk and Tikchik Rivers. The total observed escapement of 153,000 was the second lowest escapement recorded since the establishment of the Nuyakuk River counting station in 1959. Sex ratio of the spawning escapement was 41% males and 59% females.

TOGIAK DISTRICT

The Togiak district is comprised of five sections (Cape Peirce, Osviak, Matogak, Togiak and Kulukak) with the majority of the commercial catch orginating from the Togaik section. The Cape Peirce and Kulukak sections were not fished commercially in 1970.

Licensed fishing gear for the district in 1970 was 93 gill nets, including both drift and set net gear, which was 32 units less than in 1969 (Table 3). Red Salmon Company did not register fishing effort in 1970 and their usual 35 units of drift gear accounts for the decrease in effort. The highest effort recorded for drift and set net gear, based on fish ticket delivery tabulation, indicated that 72 units of gear participated in the fishery at the peak of the run. The large discrepancy between pre-season registration and actual gear in use during the season is accounted for by double registration of both types of gear by approximately 25 fishermen.

The majority of the drift fleet of double-end sailboat conversions and skiffs fished the Togiak River section, while 7 units of gear operated in the Osviak-Matogak area. The Togiak district salmon fishery is almost entirely a resident fishery, primarily from two area villages, Togiak and Twin Hills.

The district inshore red salmon forecast was for 272,000 fish (Table 2). Total runs for the various river systems in the district in 1970 totaled 366,000 red salmon or 35% higher then forecast (Table 1).

The total run of king salmon was estimated to be from 40,000 to 45,000, while the chum salmon run was estimated at 342,000, catch and escapement combined.

The very strong red salmon run in the Togiak River section and the decrease in fishing effort resulted in increased fishing time over previous years. The Togiak River section, which was open 4 days-per-week, was allowed seven days of additional fishing time by emergency order, while the remaining four sections were open 5 days-per-week.

One processor bought salmon in the Togiak district in 1970 (Table 18). Togiak Fisheries, Inc. operated a two line cannery (one - 1/2 lb. line and one 1/4 lb. line), and in addition put up mild-cured king salmon and salted chum salmon.

Management

The early season fishery at Togiak saw record catches of king salmon being made, (13,000 kings through June 26 as compared to the 10 year average of 5,000).

After the regular 3-day weekend closure (June 26-29), the first 2 days of the following week produced a record king salmon catch of 10,000 fish (Table 10). In addition to the exceptional king salmon catch, the harvest of 20,000 reds and 8,000 chum salmon severely taxed the local canneries ability to process all of the fish caught. Togiak Fisheries, Inc. eventually announced that they would receive no more fish beginning 9 a.m. Wednesday, July 1. This cannery enforced closure of 2 days, resulted in a 5-day closure of the fishery, until Monday of the following week. In all some 400 fish (mostly kings) were held to long to can and were disgarded.

By the end of the fifth week of fishing (July 10), the red salmon accumulative catch had risen to 81,000 fish, slightly higher than the long term average of 78,000 fish for the same period.

At the same time the escapement past the Togiak River counting tower had reached 42,000 red salmon by July 10, well ahead of the seasonal rate needed to reach the escapement goal for the season. The Togiak River section fishing time was subsequently extended to allow the weekly period to begin one day earlier on Sunday. However, due to religious reasons the fishermen did not take advantage of the additional opening.

By July 16, the Togiak River escapement had reached 80,000 fish, 80% of the escapement goal. The weekly period was again extended two additional days by emergency order, from 9 a.m. Friday, July 17 through 9 a.m. Sunday, July 19. The cannery, however, suspended operations for the last 24 hours of the extension due to heavy catches of red and chum salmon. Commercial catches began to drop the week of July 20-25, signifying the beginning of the end of the salmon season for the Togiak area in 1970. The normal weekend closure (July 24-27) was lifted, when it became apparent that escapement goals were assured.

Weather was not a limiting factor for the fishery in the Togiak district in 1970.

Preliminary age composition of the red salmon catch and escapement combined was 54% 4-year fish from the 1966 parent year escapement, 45% 5-year fish from 1965 and 1% 6-year fish from 1964.

Catch

The Togiak district commercial catch for all species of salmon was 296,000, representing 1% of the total Bristol Bay catch for 1970 (Table 12). This catch was 29% higher then the 17 year average of 230,000 for the area. The Togiak River section accounted for 291,000 fish, while Osviak-Matogak sections contributed 3,000 and 2,000 respectively.

The 1970 red salmon catch of 153,000 was 23% above the 17 year average of 124,000. Red salmon contributed 52% of the district harvest in 1970 (Table 10). Preliminary age composition of the district red salmon catch was 55% 4-year fish from the 1966 parent year escapement, 44% 5-year fish from 1965 and 1% 6-year fish from 1964. Preliminary sex ratio of the commercial catch was 44% males and 56% females, while average weight of reds sampled randomly throughout the season was 5.8 pounds.

The harvest of 29,000 king salmon was the largest in the history of the fishery, and was 190% higher then the 16-year average catch of 10,000 fish. Togiak king catch accounted for 20% of the total Bay catch in 1970. Preliminary sex ratio of the commercial catch was 65% males and 35% females. Average weight of kings sampled randomly from the catch was 18.8 pounds.

The total catch of 101,000 chum salmon was the seventh largest in the history of the fishery and was 15% higher than the average catch of 88,000 for the past 17 years. The chum salmon harvest was centered in the Togiak River section (96,000) while the usually strong chum producers, Osviak-Matoyak, produced only 4,000 fish. Preliminary sex ratio of the commercial chum catch was 42% males and 58% females, while the average weight was 6.6 pounds.

Late season catches of coho salmon amounted to only 2,000 fish, while over 10,000 pink salmon were also harvested. Extensive late season fishing, as has been the case in the past few years, did not take place in 1970. A combination of poor market conditions for salted coho salmon along with over-worked cannery crews caused the cannery to close operations earlier then normal.

Escapement

A counting tower was again maintained on the Togiak River to enumerate red salmon escapement into Togiak Lake, while red and king salmon escapements in the remainder of the Togiak district were estimated by aerial surveys.

The Togiak River red salmon escapement goal was 100,000 fish, with a management range of 80 to 120,000 (Table 2). The Togiak River final escapement of 192,000 reds accounted for 90% of the district escapement of 213,000 (Table 1). Inability of the cannery to process all fish caught and the resultant cannery enforced closures, probably cost the fishermen of the Togiak district over 70,000 fish, most of which would have been red salmon. Total red salmon escapement to the district was 82% higher than the 20-year average of 117,000.

Preliminary age composition of the red salmon escapement was 53% 4-year fish from the 1966 parent year escapement, 46% 5-year fish from 1965 and 1% 6-year fish from 1964. Preliminary sex ratio of the red escapement was 45% males and 55% females.

King salmon escapement was estimated to be approximately 10,000 to 15,000, with the majority of the fish again spawning in the main Togiak River and connecting tributaries.

Chum salmon aerial surveys in 1970 of eight streams in the western portion of the district (west of Togiak River) produced an escapement estimate of 66,000 or 27% of the total district chum escapement, as compared with 37,000 and 43% in 1969. Togiak River and five connecting tributaries received a spawning escapement of 134,000 chums or 56% of the district escapement, as compared to 25,000 and 29% in 1969. Six streams east of the Togiak River contributed 41,000 spawning chums in 1970 or 17% of the district total, as compared to 24,000 and 28% in 1969. Total estimated chum salmon escapement for the entire district was 241,000, as compared to 86,000 in 1969.

OTHER FISHERIES

HERRING FISHERY

For the fourth straight season a limited herring sac-roe and roe-on-kelp fishery exsisted in the Togiak district of Bristol Bay. Like the operations in previous years, this fishery could still be termed "experimental."

Three operators participated in the fishery during the month of May (Table 18). The total herring catch by all three operators amounted to over 55,000 pounds (Table 17). This catch is compared to 269,000 pounds in 1967, 182,000 pounds in 1968 and 94,000 pounds in 1969. The herring sac-roe fishery continues to be plagued by operational difficulties, fluctuating seasonal abundance of spawning herring stocks, poor weather conditions during the fishery, an inability to forecast run timing to the extent necessary to conduct a feasible operation and a very unstable market.

Harvest of herring roe-on-kelp was somewhat more successful, and one operator harvested over 38,000 pounds of kelp with herring spawn attached (Table 17). Previous production of kelp and spawn was 56,000 pounds in 1968 and 10,000 pounds in 1969. The roe-on-kelp fishery, which lasted six days in late May, was centered in Metervik Bay of the Togiak district, and was limited to rockweed kelp (Fucus sp.).

The estimated first wholesale value of the roe-on-kelp and sac-roe fishery was $14,000.

SUBSISTENCE FISHERY

Salmon subsistence catches for personal use and dog food consumption have been recorded since 1963 in Bristol Bay. This subsistence fishery is primarily centered around the Naknek-Kvichak and Nushagak drainages where local inhabitants, especially outlying villagers, are still dependent on salmon for winter dog food as well as to augment their own diets. Subsistence catches in the major two drainages approach 100 to 170,000 salmon on an annual basis.

In 1970, the subsistence salmon catch was over 174,000 fish of all species for the Naknek-Kvichak and Nushagak districts. In the Naknek-Kvichak district red salmon accounted for over 98% of the catch, while in the Nushagak district over 71% of the subsistence catch were reds, the balance being made up of king, chum, pink and coho salmon.

FISHERY BY-PRODUCTS

The salmon egg industry has continued to grow in Bristol Bay from a small scale basis in 1966 to a million dollar enterprise in 1970. Salmon eggs were processed at 13 shore-based canneries and four floaters in 1970, with production estimated at over 1,881,000 pounds, valued at approximately $2,097,000. (Table 16). As could be expected red salmon roe accounted for over 79% of the total production. This is a 88% increase over the production in 1969.

MISCELLANEOUS

Production of fresh-frozen red and king salmon continued to accelerate in Bristol Bay in 1970, with 19 operators involved in fresh, frozen or cured fishery products (Table 18).

Fresh-frozen and cured production of king salmon, primarily from the Nushagak district, amounted to 42,000 fish weighing 874,000 pounds, up slightly from 1969 when 854,000 pounds were produced (Table 14).

Production of red, chum, pink and coho salmon, which were primarily frozen amounted to 695,000 fish and 3,631,000 pounds mostly from the Naknek-Kvichak district (Table 14). This is an increase of 138% over the 1969 production of 1,526,000 pounds.

The first wholesale value of all fresh-frozen and cured commercial production was estimated to be $2,206,000 , up 82% from 1969.

One freshwater commercial permit was issued in 1970. One fisherman fished Okstukuk Lake, a small lake heading the Kokwok River, a tributary of the Nushagak River system. Fishing was conducted for 10 days during late October and early November with the catch amounting to 1,200 pounds of fish, most of which (91%) were whitefish.

TABLE 1. Summary of Bristol Bay red salmon catch and escapement, 1970[1/]

District	Escapement	Catch	Total Run
NAKNEK-KVICHAK DISTRICT			
Kvichak River	13,935,306	16,582,188	30,517,494
Naknek River	732,502	992,395	1,724,897
Alagnak River	177,060	229,222	406,282
	14,844,868	17,803,805[2/]	32,648,673
EGEGIK DISTRICT	919,734	1,403,509[3/]	2,323,243
UGASHIK DISTRICT	735,024	171,541	906,565
NUSHAGAK DISTRICT			
Wood River	1,161,964	574,062	1,736,026
Igushik River	370,920	314,961	685,881
Snake River	23,800	-0-	23,800
Nuyakuk River	364,648	242,461	607,109
Nush.-Mul. Sys.	44,824	57,050	101,874
	1,966,156	1,188,534	3,154,690
TOGIAK DISTRICT			
Togiak River	192,096		
Togiak Tributaries	10,800		
Kulukak System	10,000		
	212,896	153,377	366,273
TOTAL BRISTOL BAY	18,678,678	20,720,766	39,399,444

1/ Final catch and escapement data.
2/ Includes 323,028 fish from General district catch.
3/ Includes 36,932 fish from General district catch.

TABLE 2. Summary of Bristol Bay red salmon inshore forecast and escapement goals, 1970

District	Inshore Forecasted Run[1]	Escapement 1970 Goal	Escapement Management Escapement Range
NAKNEK-KVICHAK DISTRICT			
Kvichak River	43,732,000	19,000,000	15,000,000-23,000,000
Naknek River	2,904,000	1,000,000	800,000- 1,200,000
Alagnak River[2]	513,000	223,000	190,000- 250,000
Total	47,149,000	20,223,000	15,990,000-24,450,000
EGEGIK DISTRICT	4,050,000	1,000,000	800,000- 1,200,000
UGASHIK DISTRICT[3]	1,252,000	700,000	500,000- 900,000
NUSHAGAK DISTRICT			
Wood River	1,865,000	1,000,000	800,000- 1,200,000
Igushik River	680,000	200,000	100,000- 300,000
Snake River[2]	17,000	9,000	7,000- 11,000
Nuyakuk River[2]	400,000	214,000	180,000- 240,000
Nush.-Mul. Sys.[2]	127,000	68,000	60,000- 80,000
Total	3,089,000	1,491,000	1,147,000- 1,831,000
TOGIAK DISTRICT[4]	272,000	100,000	80,000- 120,000
TOTAL FORECAST	55,812,000	23,514,000	18,517,000-28,501,000

1/ Final Forecast of 1970 Bristol Bay Red Salmon Run. Alaska Department of Fish & Game, Informational Leaflet 146.

2/ These systems cannot be managed separately from the major system in their district. Consequently the harvest rates are merely the harvest rates anticipated for the major system in the district. The corresponding escapement goals do not necessarily coincide with the escapement levels which would be achieved if the systems could be managed independently.

3/ Excluding Mother Goose system red salmon run.

4/ Excluding red salmon runs to the Togiak tributaries and Kulukak system.

TABLE 3. Bristol Bay pre-season gear registration by district and type of gear, 1970.1/

District	Type of Gear 2/ Drift	Set	Total
NAKNEK-KVICHAK			
Resident	388	328	716
Non-resident	552	45	597
TOTAL	940	373	1,313
EGEGIK			
Resident	111	122	233
Non-resident	125	61	186
TOTAL	236	183	419
UGASHIK			
Resident	48	48	96
Non-resident	20	15	35
TOTAL	68	63	131
NUSHAGAK			
Resident	443	224	667
Non-resident	126	22	148
TOTAL	569	246	815
TOGIAK			
Resident	67	25	92
Non-resident	1	0	1
TOTAL	68	25	93
BRISTOL BAY			
Resident	1,057	747	1,804
Non-resident	824	143	967
TOTAL	1,881	890	2,771

1/ Based upon gear license count - registration at start of season does not incorporate district transfers.

2/ Legal gear in 1970 amounted to 150 fathoms for drifters and 50 fathoms for set netters.

TABLE 4. Bristol Bay fishing gear by district and period, 1970.1/

Naknek-Kvichak District			
	Number		
Period	Drift Net	Set Net	Total
5/18-23	2	2	4
5/25-30	3	0	3
6/1 - 6	2	1	3
6/8 -13	0	1	1
6/15-21	492	47	539
6/22	520	31	551
6/23	517	53	570
6/24	440	71	511
6/25	499	76	575
6/26	915	115	1,030
6/27	828	109	937
6/28	916	142	1,058
6/29	884	198	1,082
6/30	875	119	994
7/1	686	162	848
7/2	750	137	887
7/3	661	165	826
7/4	567	156	723
7/5	681	117	798
7/6	1,045	152	1,197
7/7	277	10	287
7/8	799	148	947
7/9	699	141	840
7/10	737	113	850
7/11 2/	989	149	1,138
7/12 2/	201	48	249
7/13 3/	625	32	657
7/14 3/	637	65	702
7/15 3/	415	103	518
7/16 3/	302	75	377
7/17	254	78	332
7/18	232	69	301
7/19	218	55	273
7/20-26	108	55	163
7/27-8/2	268	92	360
8/3- 8	73	64	137
8/10>	26	28	54

Ugashik District			
	Number		
Period	Drift Net	Set Net	Total
6/1- 6	4	0	4
6/8-13	9	0	9
6/15-21	8	1	9
6/22-28	6	3	9
6/29-7/5	8	4	12
7/6-12	12	15	27
7/13-19	12	20	32
7/20-26	41	16	57
7/27-8/2	16	6	22
8/3- 8	3	4	7
8/10>-	1	3	4

Egegik District			
	Number		
Period	Drift Net	Set Net	Total
6/1- 6	3	6	9
6/8-13	5	7	12
6/15-21	174	65	239
6/22-28	94	63	157
6/29	246	160	406
6/30	111	84	195
7/1	125	67	192
7/2	165	77	242
7/3	164	72	236
7/4	103	79	182
7/6- 8	170	80	250
7/9-12	118	95	213
7/13-19	79	116	195
7/20-26	70	81	151
7/27-8/2	11	10	21
8/3 - 8	12	16	28
8/10>-	6	18	24

General District 4/	
	Number
Period	Drift Net
6/8-13	3
6/15	20
6/16	33
6/17	22
6/18	17
6/19	29
6/20	21
6/21	32
6/22	65
6/23	38
6/24	122
6/25	85
6/26	117
6/27	136
6/28	71
6/29	48
6/30	13

TABLE 4. (continued)

Period	Nushagak District Number Drift Net	Set Net	Total
5/25-30	20	0	20
6/1- 6	124	0	124
6/8-13	246	2	248
6/15-16	196	44	240
6/17-19	213	58	271
6/20-23 5/	226	117	343
6/24-25	192	123	315
6/25-27 5/	96	56	152
6/27-29	196	155	351
6/30-7/1	187	151	338
7/2	215	158	403
7/3-4 5/	62	56	118
7/5	221	118	339
7/6-8	272	158	530
7/9-11	215	149	364
7/12-18	252	141	393
7/19-25	325	91	416
7/26-8/1	170	62	232
8/3- 8	30	23	53
8/10-11	0	6	6

Period	Togiak District Number Drift Net	Set Net	Total
6/8-12	47	0	47
6/15-19	49	0	49
6/22-26	55	1	56
6/29-7/3	71	1	72
7/6-10	58	2	60
7/12-19	59	1	60
7/20-25	47	1	48
7/26-8/1	50	0	50
8/3- 7	31	0	31
8/10-14	16	1	17
8/17-21	16	0	16
8/24-28	19	0	19

1/ Based on individual deliveries from fish ticket tabulations.

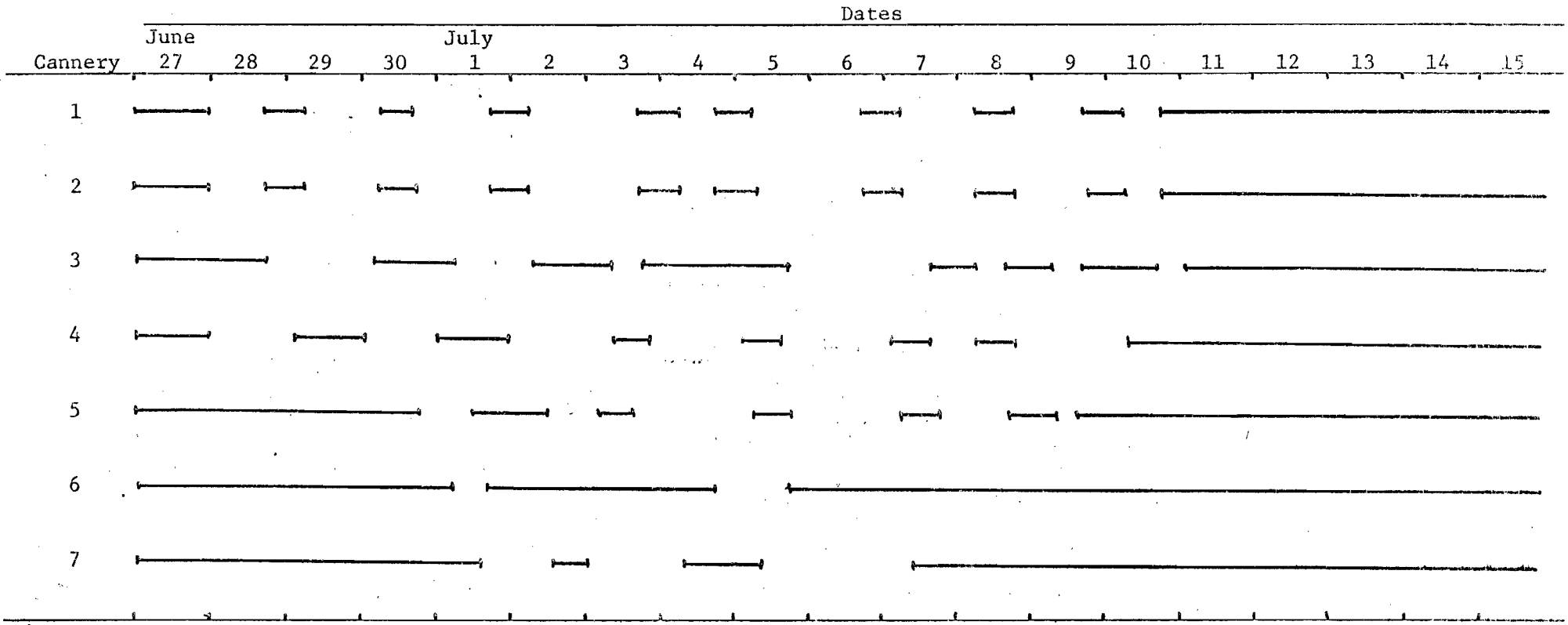
2/ Kvichak section only.

3/ Naknek section open to set net fishing only.

4/ General district open to drift fishing only.

5/ Igushik section only.

TABLE 5. Fishing periods permitted by seven canneries in the Naknek area.1/



Legend: ——— = open fishing period (24 hrs.)

——— = open fishing period (12 hrs.)

1/ Based on reports provided by canneries.

TABLE 6. Naknek-Kvichak district commercial catch by species & period, 1970

Period	Hours	Catch by Species					
		Reds	Kings	Chums	Pinks	Cohos	Total
5/25-6/13	15 days	3,037	75	97			3,209
6/15-20	5 days	54,361	2,147	1,670	3		58,181
6/21	24	59,920	488	182			60,590
6/22	24	22,024	181	33			22,238
6/23	24	18,704	275	39			19,018
6/24	24	110,928	265	409			111,602
6/25	24	317,992	707	1,218			319,917
6/26	24	345,513	691	1,306			347,510
6/27	24	1,176,133	926	4,585			1,181,644
6/28	24	1,318,216	811	3,273			1,322,300
6/29	24	1,122,213	399	2,802			1,125,414
6/30	24	836,991	1,028	2,113			840,132
7/1	24	1,100,281	711	2,786			1,103,778
7/2	24	1,076,336	469	2,691			1,079,496
7/3	24	966,688	299	2,414	72		969,473
7/4	24	1,183,954	419	2,977			1,187,350
7/5	24	1,672,900	865	6,905			1,680,670
7/6	24	461,447	201	1,932			463,580
7/7	24	1,201,841	1,147	4,998			1,207,986
7/8	24	977,625	747	4,022	1		982,395
7/9	24	841,704	474	3,499			845,677
7/10	24	1,108,946	629	4,638			1,114,213
7/11[1]	24	241,996	463	1,009			243,468
7/12	24	492,584	394	6,391			499,369
7/13[2]	24	172,357	188	2,186			174,731
7/14	24	73,372	160	926			74,458
7/15	24	75,088	69	964			76,121
7/16	24	79,612	172	1,029			80,813
7/17[3]	24	118,526	256	1,536	1		120,319
7/18	24	109,703	491	1,415			111,609
7/19	24	37,450	450	4,673			42,573
7/20-26	7 days	79,582	1,065	9,941	5,629	28	96,245
7/27-8/2	7 days	19,674	758	17,782	14,746	21	52,981
8/3>		3,079	68	2,782	7,849	4	13,782

TABLE 6. (continued)

Period	Hours	Catch by Species					
		Reds	Kings	Chums	Pinks	Cohos	Total
Totals		17,480,777	18,488	105,223	28,301	53	17,632,842
General District Prorated Catch		323,028	549	15,056	-	-	338,633
Total District Catch		17,803,805	19,037	120,279	28,301	53	17,971,475
Percent of District Catch		99.1	0.1	0.7	0.1	+	100.0

1/ Naknek section closed effective 3 a.m.

2/ Naknek section open at 5:30 a.m. to set nets only until further notice.

3/ Naknek section open at 8:30 a.m. to drift nets until further notice.

TABLE 7. Egegik district commercial catch by species & period, 1970

Period	Hours	Catch by Species					
		Reds	Kings	Chums	Pinks	Cohos	Totals
6/1- 6	5 days		17				17
6/8-13	5 days	29	62	1			92
6/15-19	5 days	12,075	617	440	1		13,133
6/20-21	2 days	6,964	142	826			7,932
6/22-28	24	295,119	1,459	7,457			304,035
6/29	24	79,512	151	1,669			81,332
6/30	24	114,594	126	2,411			117,131
7/1	24	163,766	124	3,444			167,334
7/2	24	129,837	113	2,718			132,668
7/3	24	62,917	103	1,319			64,339
7/4	24	167,768	224	3,476			171,468
7/6- 8	24	177,114	171	3,666			180,951
7/9-12	4 days	84,233	189	1,756			86,178
7/13-19	7 days	67,282	140	8,491			75,913
7/20-26	7 days	3,992	3	512	19		4,526
7/27-8/2	7 days	1,189	8	154	21	1,499	2,871
8/3- 8	6 days	106	5	12		1,893	2,016
8/10 >-		80	1	8		3,635	3,724
Totals		1,366,577	3,655	38,360	41	7,027	1,415,660
General District Prorated Catch		36,932	110	5,494	-	-	42,536
Total District Catch		1,403,509	3,765	43,854	41	7,027	1,458,196
Percent of District Catch		96.2	0.3	3.0	+	0.5	100.0

TABLE 8. Ugashik district commercial catch by species and period, 1970.

Period	Hours	Catch by Species					
		Reds	Kings	Chums	Pinks	Cohos	Totals
6/1- 6	5 days		20				20
6/8-13	5 days	1	387				388
6/15-21	7 days	157	373	6			536
6/22-24	3 days	3,203	389	343			3,935
6/25-28	4 days	9,675	149	586			10,410
6/29-7/5	7 days	38,323	104	2,784			41,211
7/6-12	7 days	45,728	20	1,385			47,133
7/13-19	7 days	67,817	47	9,402			77,266
7/20-22	3 days	4,389	6	1,991			6,386
7/23-26	4 days	1,350	3	883			2,236
7/27-8/2	7 days	792		519			1,311
8/3 >-		106		70		1,695	1,871
Totals		171,541	1,498	17,969	-	1,695	192,703
Percent of District Catch		89.0	0.8	9.3	-	0.9	100.0

TABLE 9. Nushagak district commercial catch by species & period, 1970.

Period	Hours	Catch by Species					
		Reds	Kings	Chums	Pinks	Cohos	Totals
5/25-30	5 days		120				120
6/ 1- 6	5 days		4,523				4,523
6/ 8-13	5 days	16	20,669	59			20,744
6/15-16	24	1,530	3,074	281			4,885
6/17-19	48	6,094	21,957	2,373		1	30,425
6/20-22 1/	48	7,389	271	5	1		7,666
6/22-23	30	7,572	4,840	25,000			37,412
6/24-25	24	7,660	2,983	15,768	7		26,418
6/25-27 1/	51	9,936	800	7	2		10,745
6/27-29	48	73,873	8,372	99,237	22		181,504
6/30-7/1	48	65,425	10,033	69,685	35		145,178
7/ 2	24	270,784	1,362	34,254	12		306,412
7/ 3- 4 1/	55	50,391	60	2	14		50,467
7/ 5	12	152,197	2,943	41,242	23	1	196,406
7/ 6- 8	3 days	302,991	3,165	71,619	9		377,784
7/ 9-11	3 days	125,832	712	29,192	47		155,783
7/12-18	7 days	84,856	696	22,969	48,868	680	158,069
7/19-25	7 days	18,776	721	17,730	168,580	697	206,504
7/26-8/1	6 days	3,127	236	5,520	182,409	1,495	192,787
8/ 3- 8	5 days	76	7	71	17,696	767	18,617
8/10-11	2 days	9	3	19	109	47	187
Totals		1,188,534	87,547	435,033	417,834	3,688	2,132,636
Percent of district catch		55.7	4.1	20.4	19.6	0.2	100.0

1/ Igushik section only.

TABLE 10. Togiak district commercial catch by species & periods, 1970.1/

Period	Hours2/	Catch by Species					
		Reds	Kings	Chums	Pinks	Cohos	Total
6/ 8-12	4 days	8	1,150	1			1,159
6/15-19	4 days	206	3,098	6			3,310
6/22-26	4 days	5,762	8,898	2,678	16		17,354
6/29-7/3	4 days3/	20,480	10,115	7,738	118		38,451
7/ 6-10	4 days	54,335	2,973	23,610	434		81,352
7/12-19	6 days4/	48,413	1,788	34,117	1,085		85,403
7/20-25	6 days	12,771	528	17,343	1,952		32,594
7/26-8/1	7 days	9,460	85	12,148	4,692	10	26,395
8/ 3- 7	4 days	1,537	18	2,438	2,019	48	6,060
8/10-14	4 days	253	5	301	379	55	993
8/17-21	4 days	132	6	299	32	538	1,007
8/24-28	4 days	20		32	8	1,376	1,436
Totals		153,377	28,664	100,711	10,735	2,027	295,514
Percent of district catch		51.9	9.7	34.1	3.6	0.7	100.0

1/ Includes 3,383 Osviak section fish: 291 reds, 30 kings, 3,044 chums and 18 pinks, and: includes 1,767 Matogak section fish: 338 reds, 16 kings, 1,392 chums and 21 pinks.

2/ Osviak and Matogak sections were open 5 days-per-week, while Togiak River section was open 4 days-per-week.

3/ Cannery suspended operations from 9 a.m. 7/1 to 9 a.m. 7/3 (2 days) due to heavy catch of king salmon.

4/ Fishermen did not fish 9 a.m. 7/12 to 9 a.m. 7/13 (1 day) due to religious reasons and cannery suspended 9 a.m. 7/18 to 9 a.m. 7/19 (1 day) due to heavy catch of red and chum salmon.

TABLE 11. General district commercial catch by species & period, 1970.[1/]

Period	Hours	Catch by Species			
		Reds	Kings	Chums	Totals
6/ 1- 7	7 days		228		228
6/ 8-13	6 days	40	6	17	63
6/15	24	479	12	131	622
6/16	24	878	21	279	1,178
6/17	24	1,655	9	310	1,974
6/18	24	761	7	177	945
6/19	24	1,339	9	334	1,682
6/20	24	3,068	13	469	3,550
6/21	24	2,849	11	645	3,505
6/22	24	3,078	42	272	3,392
6/23	24	3,592	12	443	4,047
6/24	24	25,238	55	3,266	28,559
6/25	24	14,693	52	2,723	17,468
6/26	24	55,530	68	4,637	60,235
6/27	24	130,355	46	3,619	134,020
6/28	24	54,469	45	1,514	56,028
6/29	24	39,043	23	1,064	40,130
6/30[2/]	24	22,893		650	23,543
Totals		359,960	659	20,550	381,169
Percent of district catch		94.4	0.2	5.4	100.0

1/ General district was divided into three sections

2/ Effective 6:00 a.m. June 30, the General district was closed for the balance of the season.

TABLE 12. Summary of Bristol Bay commercial catch by district and species, 1970.

District and River System	Catch by Species					
	Reds[1/]	Kings[2/]	Chums[2/]	Pinks	Cohos	Total
NAKNEK-KVICHAK						
Kvichak River	16,582,188					
Naknek River	992,395					
Alagnak River	229,222					
Total	17,803,805	19,037	120,279	28,301	53	17,971,475
EGEGIK	1,403,509	3,765	43,854	41	7,027	1,458,196
UGASHIK	171,541	1,498	17,969	-	1,695	192,703
NUSHAGAK						
Wood River	574,062					
Igushik River	314,961					
Snake River	-					
Nuyakuk River	242,461					
Nush.-Mul. Sys.	57,050					
Total	1,188,534	87,547	435,033	417,834	3,688	2,132,636
TOGIAK	153,377	28,664	100,711	10,735	2,027	295,514
TOTALS	20,720,766	140,511	717,846	456,911	14,490	22,050,524
SPECIE PERCENT	94.0	0.6	3.2	2.1	0.1	100.0

1/ Apportionment of the inshore red salmon catch by river system to the Naknek-Kvichak and Nushagak districts is preliminary. General district catches of red salmon (359,960 fish) were apportioned to the Naknek-Kvichak (323,028 fish) and Egegik (36,932 fish) districts.

2/ General district catches of king salmon (659 fish) and chum salmon (20,550 fish) were apportioned to the Naknek-Kvichak (549 kings - 15,056 chums) and Egegik (110 kings - 5,494 chums) districts.

TABLE 13. Bristol Bay Commercial catch by district, type of gear and species, 1970.

District	Type Gear	Catch and Percent by Species											
		Reds	%	Kings	%	Chums	%	Pinks	%	Cohos	%	Totals	%
General	Drift	359,960		659		20,550		-		-		381,169	
Naknek-Kvichak	Drift	16,756,300	96	14,119	76	91,084	87	19,014	67	28	53	16,880,545	96
	Set	724,477	4	4,369	24	14,139	13	9,287	33	25	47	752,297	4
	TOTALS	17,480,777		18,488		105,223		28,301		53		17,632,842	
Egegik	Drift	1,158,968	85	2,714	74	30,082	78	40	98	2,113	30	1,193,917	84
	Set	207,609	15	941	26	8,278	22	1	2	4,914	70	221,743	16
	TOTALS	1,366,577		3,655		38,360		41		7,027		1,415,660	
Ugashik	Drift	131,693	77	1,353	90	12,735	71	-		-		145,781	76
	Set	39,848	23	145	10	5,234	29	-		1,695	100	46,922	24
	TOTALS	171,541		1,498		17,969		-		1,695		192,703	
Nushagak	Drift	791,491	67	85,151	97	424,359	98	345,792	83	2,313	63	1,649,106	77
	Set	397,043	33	2,396	3	10,674	2	72,042	17	1,375	37	483,530	23
	TOTALS	1,188,534		87,547		435,033		417,834		3,688		2,132,636	
Togiak	Drift	152,704	99	28,580	99	100,086	99	10,676	99	2,024	100	294,070	99
	Set	673	1	84	1	625	1	59	1	3	0	1,444	1
	TOTALS	153,377		28,664		100,711		10,735		2,027		295,514	
Totals	Drift	19,351,116	93	132,576	94	678,896	94	375,522	82	6,478	45	20,544,588	93
	Set	1,369,650	7	7,935	6	38,950	6	81,389	18	8,012	55	1,505,936	7
	TOTALS	20,720,766		140,511		717,846		456,911		14,490		22,050,524	

TABLE 6. Egegik district catch by species, period, and amount of gear fished, 1971.

Period	Hours	No. Nets Fished		Catch by Species					
		Drift	Set	Reds	Kings	Chums	Pinks	Cohos	Total
6/21-23	48	117	73	13,362	418	247			14,027
6/24-26	48	208	85	65,438	552	1,025			67,015
6/27-28	24	206	84	62,489	189	876			63,554
6/29-30	24	200	81	75,582	122	1,143			76,847
7/1-2	24	213	91	64,066	105	1,352			65,523
7/4-5	24	211	86	161,547	221	2,064			163,832
7/7	12	192	83	237,087	147	2,301			239,535
7/8	12	214	87	293,298	115	2,996			296,409
7/10	12[1]/	6[2]/	93	26,665	17	352			27,034
7/11	12	206	92	200,832	111	3,431			204,374
7/14-15	12	182	82	67,934	113	2,264			70,311
7/16-17	12	88	56	21,508	33	3,198			24,739
7/19-25	7 days	73	50	15,850	29	5,003			20,882
7/26-31	5 days	5	2	576	8	333		92	1,009
8/2-7	5 days	2	3	369	3	355		154	881
8/9-14	5 days	2	2	79	4	133		677	893
Totals				1,306,682	2,187	27,073	0	923	1,336,865
Percent of District Catch				97.7	0.2	2.0	0	0.1	100.0

1/ Open for set nets only.

2/ Set net caught fish delivered on an ADF&G number.

TABLE 7. Ugashik district catch by species, period, and amount of gear fished, 1971.

Period	Hours	No. Nets Fished		Catch by Species					
		Drift	Set	Reds	Kings	Chums	Pinks	Cohos	Total
6/24-26	48	12	6	5,329	93	83			5,505
6/27-28	24	35	7	5,596	121	145			5,862
6/29-30	24	35	5	12,352	63	180			12,595
7/1-2	24	45	8	31,677	22	482			32,181
7/3	5	9	6	3,724	2	43			3,769
7/4	24	54	17	26,846	155	616			27,617
7/5	7	52	15	24,791	60	760			25,611
7/6	18	36	14	35,678	7	707			36,392
7/7	24	50	16	75,655	15	696			76,366
7/8	24	38	14	47,841	11	435			48,287
7/9	24	69	15	110,571	16	1,014			111,601
7/10	24	67	15	95,439	8	881			96,328
7/11	10	86	18	98,924	20	906			99,850
7/12	12	21	4	20,742	3	198			20,943
7/13-14	24	85	21	191,121	90	1,910			193,121
7/15-18	82	115	15	140,627	66	3,696			144,389
7/19-25	7 days	42	9	27,098	27	1,660			28,785
7/26-7/31	5 days								
8/2-8/7	5 days								
8/9-8/14	5 days		1	57				469	620
Totals				954,068	779	14,506	0	469	969,822
Percent of District Catch				98.4	+	1.5	0	+	100.0

TABLE 8. Nushagak district catch by species, period, and amount of gear fished, 1971.

Period	Hours	No. Nets Fished		Catch by Species					
		Drift	Set	Reds	Kings	Chums	Pinks	Cohos	Total
5/31-6/5	5 days	17			257				257
6/7-12	5 days	81			840				840
6/14-19	5 days	255	1	9	15,642	1			15,652
6/21-23	48	207	54	1,450	4,316	39			5,805
6/25/27	48	354	126	22,243	27,375	9,370	2		58,990
6/29-30	24	301	139	47,693	17,070	41,404			106,167
7/2-3	24	249	137	41,359	1,624	30,947			73,930
7/5-6	24	262	137	159,099	2,922	47,164	3		209,188
7/6-8[1]/	50	160	79	85,339	691	94	3		86,127
7/8-9	24	286	135	251,710	7,211	45,757			304,678
7/11-12	24	301	143	289,568	2,265	60,877	5		352,715
7/15-17	54	341	150	245,709	1,548	78,678	5	7	325,947
7/18-24	7 days	320	144	105,488	903	40,597	12	702	147,702
7/25-31	6 1/2 days	49	51	5,844	68	4,430	5	3,596	13,943
8/2-7	5 days	26	25	1,240	33	626	2	3,614	5,515
8/9-14	5 days	7	9	48	4	31		117	200
Totals				1,256,799	82,769	360,015	37	8,036	1,707,656
Percent of District Catch				73.6	4.8	21.1	+	0.5	100.0

1/ Igushik section only.

TABLE 9. Togiak district catch by species, period, and amount of gear fished, 1971.

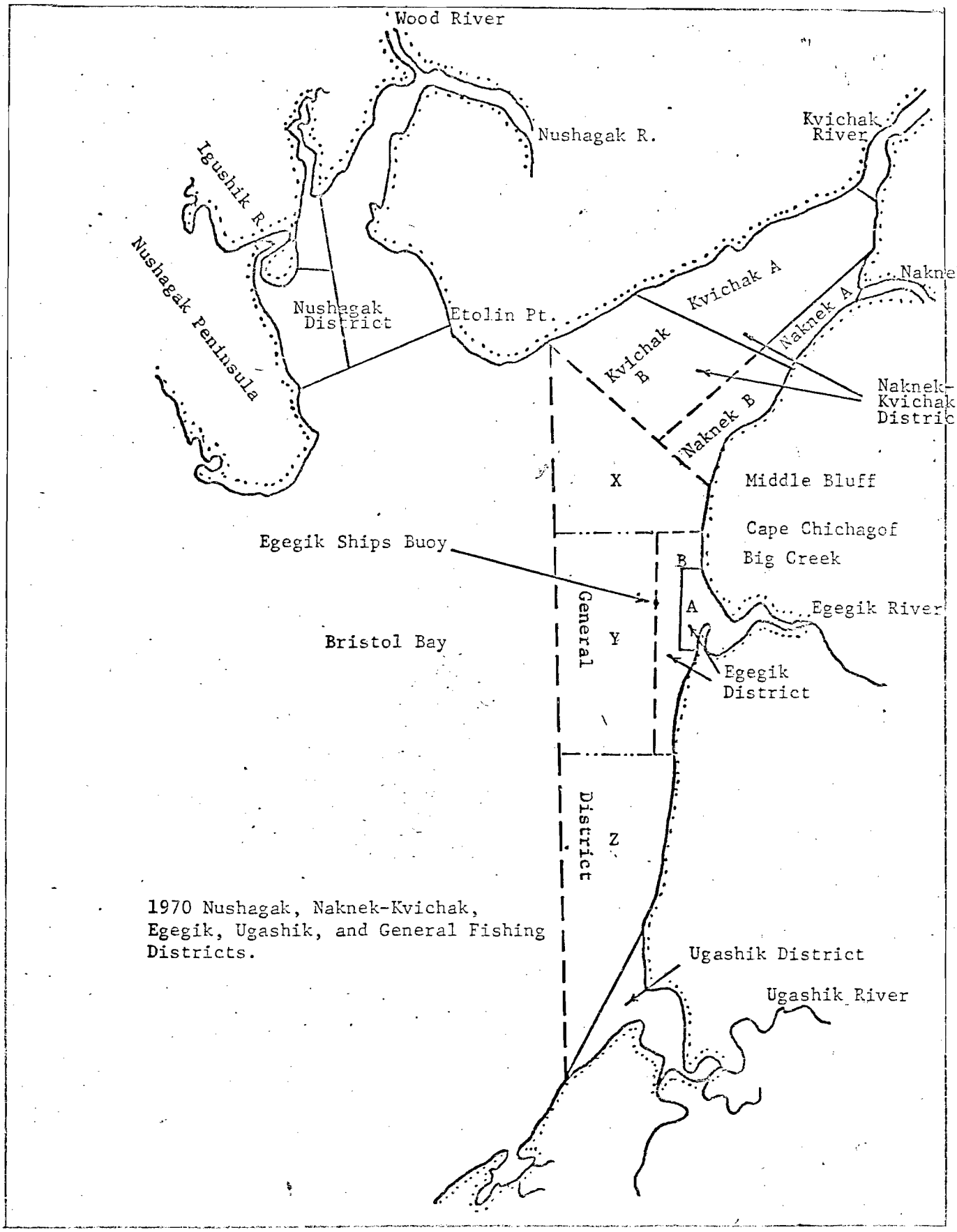
Period	Hours 2/	No. Nets Fished		Catch by Species					Totals
		Drift	Set	Reds	Kings	Chums	Pinks	Cohos	
6/14-18	4 days	29	1	240	534				774
6/21-25	4 days	87	3	1,435	5,549	471	1		7,456
6/28-7/3	5 days	86	4	12,558	11,563	3,474	28		27,623
7/5-10	5 days	98	3	54,115	4,949	13,555	60	1	72,680
7/12-15	3 days	86	2	41,713	2,528	13,531	21		57,793
7/19-24	5 1/2 days	82	1	61,203	1,452	34,308	34	3	97,000
7/25-31	7 days	93	2	32,442	373	37,649	22	3	70,489
8/1-6	6 days	65	1	4,535	72	19,418	6	36	24,067
8/9-13	4 days	23		552	6	688	1	72	1,319
8/16-20	4 days	16		222		717		794	1,733
8/23-27	4 days	13		45		36		2,283	2,364
Totals				209,060	27,026	123,847	173	3,192	363,298
Percent of District Catch				57.5	7.4	34.1	0.1	0.9	100.0

1/ Includes 3,623 Osviak section fish: 626 reds, 55 kings, 2,938 chums and 4 pinks; and 11,112 Kulukak section fish: 7,927 reds, 866 kings, 2,313 chums and 6 pinks.

2/ Osviak and Kulukak sections were open 5 days-per-week, while the Togiak River section section was open 4 days-per-week.

TABLE 17. Togiak district herring catch and kelp harvest in pounds by day, 1970.

Date	No. Deliveries	Catch in Pounds	
		Daily	Accumulative
	Herring		
May 14	1	1,760	1,760
15	6	5,643	7,403
16	9	19,310	26,713
17	2	6,464	33,177
18	4	18,509	51,686
19	3	2,996	54,682
May 20	1	513	55,195
Totals	26	55,195	
	Herring-Roe-on-Kelp		
May 17	1	2,680	2,680
18	4	11,130	13,810
19	4	5,160	18,970
20	5	9,215	28,185
21	5	7,880	36,065
22	4	2,790	38,855
Totals	23	38,855	



1970 Nushagak, Naknek-Kvichak, Egegik, Ugashik, and General Fishing Districts.

Figure 1